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EXAMINER	
LELE, TANMAY S	
ART UNIT	PAPER NUMBER
2681	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

Office Action Summary	Application No. 09/464,520	Applicant(s) NAKAYAMA, MASAHIKO
	Examiner Tanmay S Lele	Art Unit 2681

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 15 December 1999 .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-17 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-17 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 15 December 1999 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 3, 15, and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 3, it was not understood what was meant by "inter-channel ratio information." For purposes of examining, this was assumed this to be information provided by the DSP pertaining to the number of signals being multiplexed. Appropriate correction is required.

Regarding claims 15 and 16, it was not understood what was meant by the "specified ratio." For purposes of examining, this was assumed this to be information provided by the DSP pertaining to the number of signals being multiplexed. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who

has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claim 7 is rejected under 35 U.S.C. 102(e) as being anticipated by Ohnushi et al. (Ohnishi, US Patent No 4,261,051).

Regarding claim 7, Ohnishi teaches of a level adjusting circuit comprising a plurality of bit shift means for shifting input baseband signals to the right by different certain bits (column 4, lines 46 – 53), a plurality of switches for selecting outputs from said respective bit shift means in accordance with a desired gain desired to be set (column 4, lines 28 – 45; note that the AND gates are configured as switches), and an adder for adding outputs from said respective switches for output as one signal (column 4, lines 25 – 28; note that the OR gate as configured will actually provide for the final sum value at the output).

6. Claim 10 is rejected under 35 U.S.C. 102(e) as being anticipated by Rakib et al. (Rakib, US Patent No. 6,307,868).

Regarding claim 10, Rakib teaches of a method of controlling a transmission level in a baseband signal multiplexing circuit for multiplexing a plurality of baseband signals spread with different spread codes into one baseband signal, said method comprising the steps of calculating a gain set value with which an amplitude value of a multiplexed baseband signal matches a

dynamic range in D/A conversion based on the number of transmission codes which is the number of multiplexed baseband signals and adjusting the amplitude value of the code-multiplexed baseband signal prior to the D/A conversion based on the gain set value (beginning column 75, line 62 and ending column 76, line 18).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1-6 and 11–16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kornfeld et al. (Kornfeld, US Patent No. 5,974,041) in view of Rakib et al. (Rakib, US Patent No. 6,307,868).

Regarding claim 1, Kornfeld teaches of a baseband signal multiplexing circuit for multiplexing a plurality of baseband signals spread with different spread codes into one baseband signal comprising a plurality of baseband filters for respectively limiting bands of the respective baseband signals input thereto (seen in Figure 7 and described in column 10, lines 64 – 67), adding means for adding and code-multiplexing the plurality of baseband signals with the bands limited by said respective baseband filters to produce one baseband signal (seen in Figure 7 and detailed in column 11, lines 5-7), and a D/A converting means for converting the baseband signal which is a digital signal outputted into an analog signal (seen in Figure 7 and described in column 11, lines 1- 3).

Kornfeld does not teach of a level adjusting means for adjusting an amplitude value of the baseband signal produced by said adding means based on a control signal to output the signal or of a gain setting means for calculating a gain set value with which the amplitude value of the baseband signal, outputted from said level adjusting means is adjusted to an amplitude value matching a dynamic range of said D/A converting means based on the number of transmission codes which is the number of multiplexed baseband signals, and for notifying said level adjusting means of the gain set value with said control signal.

In an analogous art dealing with synchronous CDMA transmission, Rakhib teaches of level adjusting means for adjusting an amplitude value of the baseband signal produced by said adding means based on a control signal to output the signal or of a gain setting means for calculating a gain set value with which the amplitude value of the baseband signal, outputted from said level adjusting means is adjusted to an amplitude value matching a dynamic range of said D/A converting means based on the number of transmission codes which is the number of multiplexed baseband signals, and for notifying said level adjusting means of the gain set value with said control signal (as seen in Figure 32 and 33 and detailed starting on column 75, line 63 and ending column 76, line 17).

It would have been obvious to one skilled in the art at the time of invention to have included into Kornfeld's system of baseband transmission, the system of adjusting dynamic range as described by Rakhib for the purposes of operating within the dynamic range of the D/A converter and thus allowing for a cleaner transmitted signal (as internal noise from the D/A converter is present when not operating in the D/A converter's dynamic range), as taught by Rakhib.

Regarding claim 2, Kornfeld teaches of a baseband signal multiplexing circuit for multiplexing a plurality of baseband signals spread with different spread codes into one baseband signal, comprising a plurality of baseband filters for respectively limiting bands of the respective baseband signals input thereto (seen in Figure 7 and described in column 10, lines 64 – 67), adding means for adding and code-multiplexing the plurality of baseband signals to produce one baseband signal (as seen in Figure 7 and detailed in column 11, 5-8), and D/A converting means for converting the baseband signal which is a digital signal outputted (as seen in Figure 7 and detailed in column 11, lines 1 – 5).

Kornfeld does not teach of a gain setting means for calculating a gain set value with which an amplitude value of the baseband signal outputted from said adding means is adjusted to an amplitude value matching a dynamic range of said D/A converting means based on the number of transmission codes which is the number of multiplexed baseband signals and for notifying said level adjusting means of the gain set value with said control signal or of a plurality of level adjusting means for respectively adjusting amplitude values of the plurality of baseband signals with the bands limited by said respective baseband filters based on a control signal to output the signals. Kornfeld also does not teach of the line-up of components as claimed.

In an analogous art dealing with synchronous CDMA transmission, Rakhib teaches of a gain setting means for calculating a gain set value with which an amplitude value of the baseband signal outputted from said adding means is adjusted to an amplitude value matching a dynamic range of said D/A converting means based on the number of transmission codes which is the number of multiplexed baseband signals, and for notifying said level adjusting means of the gain set value with said control signal or of a plurality of level adjusting means for

respectively adjusting amplitude values of the plurality of baseband signals with the bands limited by said respective baseband filters based on a control signal to output the signals (as seen in Figure 32 and 33 and detailed starting on column 75, line 63 and ending column 76, line 17).

It would have been obvious to one skilled in the art at the time of invention to have included into Kornfeld's system of baseband transmission, the system of adjusting dynamic range as described by Rakhib for the purposes of operating within the dynamic range of the D/A converter and thus allowing for a cleaner transmitted signal (as internal noise from the D/A converter is present when not operating in the D/A converter's dynamic range), as taught by Rakhib.

Kornfeld in view of Rakhib do not teach of the line-up of components as claimed. As the purpose of the invention is to provide means such that the dynamic range criteria of the D/A converter is met, it is believed that the merely moving and distributing the function of these components (ie the level adjusting circuit) to achieve this goal is obvious and not novel, as no benefit in changing component position or in distributing its function has been detailed. Therefore, it would have been obvious to one skilled in the art, at the time of invention, to have added multiple level adjusting circuits at the output of the baseband band filters and prior to the summer for the purposes of obtaining a baseband signal that was within the dynamic range of the D/A converter and would thus allow for a less noisy baseband signal to be transmitted.

Regarding claim 3, Kornfeld teaches of a baseband signal multiplexing circuit for multiplexing a plurality of baseband signals spread with different spread codes into one baseband signal comprising of a plurality of baseband filters for respectively limiting bands of the respective baseband signals input thereto (seen in Figure 7 and described in column 10, lines 64

– 67), adding means for adding and code-multiplexing the plurality of baseband signals outputted to produce one baseband signal (as seen Figure 7 and detailed in column 11, lines 3 – 7), and D/A converting means for converting the baseband signal which is a digital signal into an analog signal (as seen in Figure 7 and detailed in column 11, lines 1 – 6).

Kornfeld does not teach of a plurality of level adjusting means for respectively adjusting amplitude values of the plurality of baseband signals with the bands limited by said respective baseband filters based on a plurality of control signals to output the signals, of gain setting means for calculating for respective said level adjusting circuits gain set value with which an amplitude value of the baseband signal outputted from said adding means is adjusted to an amplitude value matching a dynamic range of said D/A converting means based on the number of transmission codes which is the number of multiplexed baseband signals and based on inter-channel ratio information for specifying an amplitude ratio of the respective baseband signals when the plurality of baseband signals are multiplexed, and for notifying said level adjusting means of the gain set values with said plurality of control signals, nor of the line-up of components as claimed.

In an analogous art dealing with synchronous CDMA transmission, Rakhib teaches of a (plurality of) level adjusting means for respectively adjusting amplitude values of the plurality of baseband signals with the bands limited by said respective baseband filters based on a plurality of control signals to output the signals (as seen in Figure 32 and 33, and detailed in column 75, lines 62 – 67) and of gain setting means for calculating for respective said level adjusting circuits gain set value with which an amplitude value of the baseband signal outputted from said adding means is adjusted to an amplitude value matching a dynamic range of said D/A converting means based on the number of transmission codes which is the number of multiplexed baseband

signals and based on inter-channel ratio information (specifically column 75, lines 62 – 66) for specifying an amplitude ratio of the respective baseband signals when the plurality of baseband signals are multiplexed and for notifying said level adjusting means of the gain set values with said (plurality of) control signals (as seen in Figures 32 and 33 and described beginning column 75, line 62 and ending column 76, line 18).

It would have been obvious to one skilled in the art at the time of invention to have included into Kornfeld's system of baseband transmission, the system of adjusting dynamic range as described by Rakhib for the purposes of operating within the dynamic range of the D/A converter and thus allowing for a cleaner transmitted signal (as internal noise from the D/A converter is present when not operating in the D/A converter's dynamic range), as taught by Rakhib.

Kornfeld in view of Rakhib do not teach of the line-up of components as claimed. As the purpose of the invention is to provide means such that the dynamic range criteria of the D/A converter is met, it is believed that the merely moving and distributing the function of these components (ie the level adjusting circuit) to achieve this goal is obvious and not novel, as no benefit in changing component position or in distributing its function has been detailed. Therefore, it would have been obvious to one skilled in the art, at the time of invention, to have added multiple level adjusting circuits at the output of the baseband band filters and prior to the summer for the purposes of obtaining a baseband signal that was within the dynamic range of the D/A converter and would thus allow for a less noisy baseband signal to be transmitted.

Regarding claim 4, Kornfeld teaches of a baseband signal multiplexing circuit for multiplexing a plurality of baseband signals spread with different spread codes into one baseband

signal comprising of adding means for adding and code-multiplexing the respective baseband signals input thereto to produce one baseband signal (as seen in Figure 7 and described in column 11, lines 3-7), a baseband filter for limiting a band of the baseband signal produced by said adding means (as seen in Figure 7 and detailed in column 10, lines 64 – 67), and D/A converting means for converting the baseband signal which is a digital signal into an analog signal (as seen in Figure 7 and detailed in column 11, lines 1-7).

Kornfeld does not teach of a level adjusting means for adjusting an amplitude value of the baseband signal with the band limited by said baseband filter based on a control signal to output the signal, gain setting means for calculating a gain set value with which the amplitude value of the baseband signal outputted from said level adjusting means is adjusted to an amplitude value matching a dynamic range of said D/A converting means based on the number of transmission codes which is the number of multiplexed baseband signals and for notifying said level adjusting means of the gain set value with said control signal. Kornfeld also does not teach of the of the line-up of components as claimed.

In an analogous art dealing with synchronous CDMA transmission, Rakhib teaches of a level adjusting means for adjusting an amplitude value of the baseband signal with the band limited by said baseband filter based on a control signal to output the signal, gain setting means for calculating a gain set value with which the amplitude value of the baseband signal outputted from said level adjusting means is adjusted to an amplitude value matching a dynamic range of said D/A converting means based on the number of transmission codes which is the number of multiplexed baseband signals and for notifying said level adjusting means of the gain set value

with said control signal (as seen in Figures 32 and 33 and detailing starting column 75, line 62 and ending column 76, line 18).

It would have been obvious to one skilled in the art at the time of invention to have included into Kornfeld's system of baseband transmission, the system of adjusting dynamic range as described by Rakhib for the purposes of operating within the dynamic range of the D/A converter and thus allowing for a cleaner transmitted signal (as internal noise from the D/A converter is present when not operating in the D/A converter's dynamic range), as taught by Rakhib.

Kornfeld in view of Rakhib do not teach of the line-up of components as claimed. As the purpose of the invention is to provide means such that the dynamic range criteria of the D/A converter is met, it is believed that the merely moving and distributing the function of these components (ie the level adjusting circuit) to achieve this goal is obvious and not novel, as no benefit in changing component position or in distributing its function has been detailed. Therefore, it would have been obvious to one skilled in the art, at the time of invention, to have added multiple level adjusting circuits at the output of the baseband band filters and prior to the summer for the purposes of obtaining a baseband signal that was within the dynamic range of the D/A converter and would thus allow for a less noisy baseband signal to be transmitted.

Regarding claim 5, Kornfeld teaches of a baseband signal multiplexing circuit for multiplexing a plurality of baseband signals spread with different spread codes into one baseband signal comprising of a plurality of baseband filters for respectively limiting bands of the respective baseband signals input thereto (as seen in Figure 7 and detailed in column 10, lines 64 – 67), adding means for adding and code-multiplexing the plurality of baseband signals to

produce one baseband signal (as seen in Figure 7 and detailed in column 11, lines 3-7), D/A converting means for converting the baseband signal which is a digital signal into an analog signal (as seen Figure 7 and detailed in column 11, lines 1 – 3).

Kornfeld does not teach of a (plurality of) first level adjusting means for respectively adjusting amplitude values of the plurality of baseband signals with the bands limited by said respective baseband filters based on a plurality of first control signals to output the signals, a second level adjusting means for adjusting an amplitude value of the baseband signal produced by said adding means based on a second control signal to output the signal, gain setting means for outputting to said respective first level adjusting means the first control signals for adjusting amplitude ratios of the respective baseband signals in accordance with inter-channel ratio information for specifying amplitude ratios of the respective baseband signals when the plurality of baseband signals are multiplexed, for calculating a gain set value with which the amplitude value of the baseband signal outputted from said second level adjusting means is adjusted to an amplitude value matching a dynamic range of said D/A converting means based on the number of transmission codes which is the number of multiplexed baseband signals, and for notifying said second level adjusting means of the gain set value with said second control signal.

In an analogous art dealing with synchronous CDMA transmission, Rakhib teaches of a (plurality of first) level adjusting means for respectively adjusting amplitude values of the plurality of baseband signals with the bands limited by said respective baseband filters based on a plurality of first control signals to output the signals, gain setting means for outputting to said respective (first) level adjusting means the first control signals for adjusting amplitude ratios of the respective baseband signals in accordance with inter-channel ratio information for specifying

amplitude ratios of the respective baseband signals when the plurality of baseband signals are multiplexed, for calculating a gain set value with which the amplitude value of the baseband signal outputted to an amplitude value matching a dynamic range of said D/A converting means based on the number of transmission codes which is the number of multiplexed baseband signals, and for notifying (said second) level adjusting means of the gain set value with said (second) control signal (as seen in Figures 32 and 33 and detailed starting column 75, line 62 and ending in column 76, line 18).

It would have been obvious to one skilled in the art at the time of invention to have included into Kornfeld's system of baseband transmission, the system of adjusting dynamic range as described by Rakhib for the purposes of operating within the dynamic range of the D/A converter and thus allowing for a cleaner transmitted signal (as internal noise from the D/A converter is present when not operating in the D/A converter's dynamic range), as taught by Rakhib.

Kornfeld in view of Rakhib do not teach of the line-up of components as claimed. As the purpose of the invention is to provide means such that the dynamic range criteria of the D/A converter is met, it is believed that the merely moving and distributing the function of these components (ie the level adjusting circuit) to achieve this goal is obvious and not novel, as no benefit in changing component position or in distributing its function has been detailed. Therefore, it would have been obvious to one skilled in the art, at the time of invention, to have added multiple level adjusting circuits at the output of the baseband band filters and prior to the summer for the purposes of obtaining a baseband signal that was within the dynamic range of the D/A converter and would thus allow for a less noisy baseband signal to be transmitted.

Regarding claim 6, Kornfeld teaches of a baseband signal multiplexing circuit for multiplexing a plurality of baseband signals spread with different spread codes into one baseband signal comprising of adding means for adding and code-multiplexing the plurality of baseband to produce one baseband signal (as seen in Figure 7 and detailed in column 11 lines 3 – 7), a baseband filter for limiting a band of the baseband signal (produced by said adding means) (as seen in Figure 7 and detailed in column 10, lines 64 – 67), and D/A converting means for converting the baseband signal which is a digital signal (outputted from said second level adjusting means) into an analog signal (as seen in Figure 7 and detailed in column 11, lines 1 – 7).

Kornfeld does not teach of a plurality of first level adjusting means for respectively adjusting amplitude values of said respective baseband signals input thereto based on a plurality of first control signals, a second level adjusting means for adjusting an amplitude value of the baseband signal with the band limited by said baseband filter based on a second control signal to output the signal, gain setting means for outputting to said respective first level adjusting means the first control signals for adjusting an amplitude ratio of the respective baseband signals in accordance with inter-channel ratio information for specifying an amplitude ratio of the respective baseband signals when the plurality of baseband signals are multiplexed for calculating a gain set value with which the amplitude value of the baseband signal outputted from said second level adjusting means is adjusted to an amplitude value matching a dynamic range of said D/A converting means based on the number of transmission codes which is the number of multiplexed baseband signals, and for notifying said second level adjusting means of the gain set value with said second control signal.

In an analogous art dealing with synchronous CDMA transmission, Rakhib teaches of a (plurality of first) level adjusting means for respectively adjusting amplitude values of said respective baseband signals input thereto based on a plurality of first control signals, a (second) level adjusting means for adjusting an amplitude value of the baseband signal with the band limited by said baseband filter based on a second control signal to output the signal, gain setting means for outputting to (said respective first) level adjusting means the (first) control signals for adjusting an amplitude ratio of the respective baseband signals in accordance with inter-channel ratio information for specifying an amplitude ratio of the respective baseband signals when the plurality of baseband signals are multiplexed for calculating a gain set value with which the amplitude value of the baseband signal outputted from said (second) level adjusting means is adjusted to an amplitude value matching a dynamic range of said D/A converting means based on the number of transmission codes which is the number of multiplexed baseband signals, and for notifying said (second) level adjusting means of the gain set value with said (second) control signal (as seen in Figures 32 and 33 and detailed starting column 75, line 62 and ending in column 76, line 18).

It would have been obvious to one skilled in the art at the time of invention to have included into Kornfeld's system of baseband transmission, the system of adjusting dynamic range as described by Rakhib for the purposes of operating within the dynamic range of the D/A converter and thus allowing for a cleaner transmitted signal (as internal noise from the D/A converter is present when not operating in the D/A converter's dynamic range), as taught by Rakhib.

Kornfeld in view of Rakhib do not teach of the line-up of components as claimed. As the purpose of the invention is to provide means such that the dynamic range criteria of the D/A converter is met, it is believed that the merely moving and distributing the function of these components (ie the level adjusting circuit) to achieve this goal is obvious and not novel, as no benefit in changing component position or in distributing its function has been detailed. Therefore, it would have been obvious to one skilled in the art, at the time of invention, to have added multiple level adjusting circuits at the output of the baseband band filters and prior to the summer for the purposes of obtaining a baseband signal that was within the dynamic range of the D/A converter and would thus allow for a less noisy baseband signal to be transmitted.

Regarding claim 11, Kornfeld teaches of a method of controlling a transmission level in a baseband signal multiplexing circuit for multiplexing a plurality of baseband signals spread with different spread codes into one baseband signal, said method comprising the steps of limiting bands of the respective baseband signals input thereto (column 10, lines 64 – 67), adding and code-multiplexing the plurality of baseband signals with the limited bands to produce one baseband signal (column 11, lines 3 – 10), and D/A converting the baseband signal into an analog signal (column 11, lines 1- 7).

Kornfeld does not teach of calculating a gain set value with which an amplitude value of the code-multiplexed baseband signal matches a dynamic range in D/A conversion based on the number of transmission codes which is the number of multiplexed baseband signals, adjusting the amplitude value of the code multiplexed baseband signal based on the gain set value, or of D/A converting the level adjust digital signal.

In an analogous art dealing with synchronous CDMA transmission, Rakhib teaches of

calculating a gain set value with which an amplitude value of the code-multiplexed baseband signal matches a dynamic range in D/A conversion based on the number of transmission codes which is the number of multiplexed baseband signals, adjusting the amplitude value of the code multiplexed baseband signal based on the gain set value, or of D/A converting the level adjust digital signal (starting column 75, line 62 and ending column 76, line 18).

It would have been obvious to one skilled in the art at the time of invention to have included into Kornfeld's system of baseband transmission, the system of adjusting dynamic range as described by Rakhib for the purposes of operating within the dynamic range of the D/A converter and thus allowing for a cleaner transmitted signal (as internal noise from the D/A converter is present when not operating in the D/A converter's dynamic range), as taught by Rakhib.

Regarding claim 12, Kornfeld teaches of a method of controlling a transmission level in a baseband signal multiplexing circuit for multiplexing a plurality of baseband signals spread with different spread codes into one baseband signal, said method comprising the steps of
limiting bands of the respective baseband signals input thereto (column 10, lines 64 – 67), adding and code-multiplexing the plurality of baseband signals to produce one baseband signal (column 11, lines 3 – 10), and D/A converting the baseband signal after the code-multiplexing into an analog signal (column 11, lines 1- 7).

Kornfeld does not teach of calculating a gain set value with which amplitude values of the plurality of baseband signals with the limited bands match a dynamic range in D/A conversion based on the number of transmission codes which is the number of multiplexed

baseband signals, adjusting the amplitude values of the plurality of baseband signals with the limited bands based on the gain set value or of adding the signals after amplitude adjustment.

In an analogous art dealing with synchronous CDMA transmission, Rakhib teaches of calculating a gain set value with which amplitude values of the plurality of baseband signals with the limited bands match a dynamic range in D/A conversion based on the number of transmission codes which is the number of multiplexed baseband signals, adjusting the amplitude values of the plurality of baseband signals with the limited bands based on the gain set value (starting column 75, line 62 and ending column 76, line 18).

It would have been obvious to one skilled in the art at the time of invention to have included into Kornfeld's system of baseband transmission, the system of adjusting dynamic range as described by Rakhib for the purposes of operating within the dynamic range of the D/A converter and thus allowing for a cleaner transmitted signal (as internal noise from the D/A converter is present when not operating in the D/A converter's dynamic range), as taught by Rakhib.

Kornfeld in view of Rakhib do not teach of the line-up of components as claimed. As the purpose of the invention is to provide means such that the dynamic range criteria of the D/A converter is met, it is believed that the merely moving and distributing the function of these components (ie the level adjusting circuit) to achieve this goal is obvious and not novel, as no benefit in changing component position or in distributing its function has been detailed. Therefore, it would have been obvious to one skilled in the art, at the time of invention, to have added multiple level adjusting circuits at the output of the baseband band filters and prior to the

summer for the purposes of obtaining a baseband signal that was within the dynamic range of the D/A converter and would thus allow for a less noisy baseband signal to be transmitted.

Regarding claim 13, Kornfeld teaches of a method of controlling a transmission level in a baseband signal multiplexing circuit for multiplexing a plurality of baseband signals spread with different spread codes into one baseband signal, said method comprising the steps of limiting bands of the respective baseband signals input thereto (column 10, lines 64 – 67), adding and code-multiplexing the plurality of baseband signals to produce one baseband signal (column 11, lines 3 – 10), and D/A converting the baseband signal after the code-multiplexing into an analog signal (column 11, lines 1- 7).

Kornfeld does not teach of calculating for the respective baseband signals gain set values with which amplitude values of the plurality of baseband signals with the limited bands match a dynamic range in D/A conversion based on the number of transmission codes which is the number of multiplexed baseband signals or of adjusting the amplitude values of the plurality of baseband signals with the limited bands based on the gain set values.

In an analogous art dealing with synchronous CDMA transmission, Rakhib teaches of calculating for the respective baseband signals gain set values with which amplitude values of the plurality of baseband signals with the limited bands match a dynamic range in D/A conversion based on the number of transmission codes which is the number of multiplexed baseband signals or of adjusting the amplitude values of the plurality of baseband signals with the limited bands based on the gain set values (starting column 75, line 62 and ending column 76, line 18).

It would have been obvious to one skilled in the art at the time of invention to have included into Kornfeld's system of baseband transmission, the system of adjusting dynamic range as described by Rakhib for the purposes of operating within the dynamic range of the D/A converter and thus allowing for a cleaner transmitted signal (as internal noise from the D/A converter is present when not operating in the D/A converter's dynamic range), as taught by Rakhib.

Kornfeld in view of Rakhib do not teach of the line-up of components as claimed. As the purpose of the invention is to provide means such that the dynamic range criteria of the D/A converter is met, it is believed that the merely moving and distributing the function of these components (ie the level adjusting circuit) to achieve this goal is obvious and not novel, as no benefit in changing component position or in distributing its function has been detailed. Therefore, it would have been obvious to one skilled in the art, at the time of invention, to have added multiple level adjusting circuits at the output of the baseband band filters and prior to the summer for the purposes of obtaining a baseband signal that was within the dynamic range of the D/A converter and would thus allow for a less noisy baseband signal to be transmitted.

Regarding claim 14, Kornfeld teaches of a method of controlling a transmission level in a baseband signal multiplexing circuit for multiplexing a plurality of baseband signals spread with different spread codes into one baseband signal, said method comprising the steps of adding and code-multiplexing the respective baseband signals input thereto to produce one baseband signal (column 11, lines 3 – 10), limiting a band of the code-multiplexed baseband signal (column 10, lines 64 – 67), and D/A converting the baseband signal into an analog signal (column 11, lines 1- 7).

Kornfeld does not teach of calculating a gain set value with which an amplitude value of the baseband signal with the limited band matches a dynamic range in D/A conversion based on the number of transmission codes which is the number of multiplexed baseband signals or adjusting the amplitude value of the baseband signal with the limited band based on the gain set value.

In an analogous art dealing with synchronous CDMA transmission, Rakhib teaches of calculating a gain set value with which an amplitude value of the baseband signal with the limited band matches a dynamic range in D/A conversion based on the number of transmission codes which is the number of multiplexed baseband signals or adjusting the amplitude value of the baseband signal with the limited band based on the gain set value (starting column 75, line 62 and ending column 76, line 18).

It would have been obvious to one skilled in the art at the time of invention to have included into Kornfeld's system of baseband transmission, the system of adjusting dynamic range as described by Rakhib for the purposes of operating within the dynamic range of the D/A converter and thus allowing for a cleaner transmitted signal (as internal noise from the D/A converter is present when not operating in the D/A converter's dynamic range), as taught by Rakhib.

Kornfeld in view of Rakhib do not teach of the line-up of components as claimed. As the purpose of the invention is to provide means such that the dynamic range criteria of the D/A converter is met, it is believed that the merely moving and distributing the function of these components (ie the level adjusting circuit) to achieve this goal is obvious and not novel, as no benefit in changing component position or in distributing its function has been detailed.

Therefore, it would have been obvious to one skilled in the art, at the time of invention, to have added multiple level adjusting circuits at the output of the baseband band filters and prior to the summer for the purposes of obtaining a baseband signal that was within the dynamic range of the D/A converter and would thus allow for a less noisy baseband signal to be transmitted.

Regarding claim 15, Kornfeld teaches of a method of controlling a transmission level in a baseband signal multiplexing circuit for multiplexing a plurality of baseband signals spread with different spread codes into one baseband signal, said method comprising the steps of limiting bands of the respective baseband signals input thereto (column 10, lines 64 – 67), adding and code-multiplexing the respective baseband signals to produce one baseband signal (column 11, lines 3 – 10), and D/A converting the baseband signal into an analog signal (column 11, lines 1-7).

Kornfeld does not teach of adjusting respective amplitude values of the plurality of baseband signals with the limited bands based on a specified ratio, calculating a gain set value with which an amplitude value of the code-multiplexed baseband signal matches a dynamic range in D/A conversion based on the number of transmission codes which is the number of multiplexed baseband signals, or of adjusting the amplitude value of the code-multiplexed baseband signal based on the gain set value.

In an analogous art dealing with synchronous CDMA transmission, Rakhib teaches of adjusting respective amplitude values of the plurality of baseband signals with the limited bands based on a specified ratio, calculating a gain set value with which an amplitude value of the code-multiplexed baseband signal matches a dynamic range in D/A conversion based on the number of transmission codes which is the number of multiplexed baseband signals, or of

adjusting the amplitude value of the code-multiplexed baseband signal based on the gain set value (starting column 75, line 62 and ending column 76, line 18).

It would have been obvious to one skilled in the art at the time of invention to have included into Kornfeld's system of baseband transmission, the system of adjusting dynamic range as described by Rakhib for the purposes of operating within the dynamic range of the D/A converter and thus allowing for a cleaner transmitted signal (as internal noise from the D/A converter is present when not operating in the D/A converter's dynamic range), as taught by Rakhib.

Kornfeld in view of Rakhib do not teach of the line-up of components as claimed. As the purpose of the invention is to provide means such that the dynamic range criteria of the D/A converter is met, it is believed that the merely moving and distributing the function of these components (ie the level adjusting circuit) to achieve this goal is obvious and not novel, as no benefit in changing component position or in distributing its function has been detailed. Therefore, it would have been obvious to one skilled in the art, at the time of invention, to have added multiple level adjusting circuits at the output of the baseband band filters and prior to the summer for the purposes of obtaining a baseband signal that was within the dynamic range of the D/A converter and would thus allow for a less noisy baseband signal to be transmitted.

Regarding claim 16, Kornfeld a method of controlling a transmission level in a baseband signal multiplexing circuit for multiplexing a plurality of baseband signals spread with different spread codes into one baseband signal, said method comprising the steps of D/A converting the baseband signal into an analog signal (column 11, lines 1- 7), adding and code-multiplexing the

respective baseband signals to produce one baseband signal (column 11, lines 3 – 10), limiting a band of the code-multiplexed baseband signal (column 10, lines 64 – 67).

Kornfeld does not teach of calculating a gain set value with which an amplitude value of the baseband signal with the limited band matches a dynamic range in D/A conversion based on the number of transmission codes which is the number of multiplexed baseband signals, adjusting the amplitude value of the baseband signal with the limited band based on the gain set value, or of adjusting respective amplitude values of the respective baseband signals input thereto based on a specified ratio.

In an analogous art dealing with synchronous CDMA transmission, Rakhib teaches of calculating a gain set value with which an amplitude value of the baseband signal with the limited band matches a dynamic range in D/A conversion based on the number of transmission codes which is the number of multiplexed baseband signals, adjusting the amplitude value of the baseband signal with the limited band based on the gain set value, or of adjusting respective amplitude values of the respective baseband signals input thereto based on a specified ratio (starting column 75, line 62 and ending column 76, line 18).

It would have been obvious to one skilled in the art at the time of invention to have included into Kornfeld's system of baseband transmission, the system of adjusting dynamic range as described by Rakhib for the purposes of operating within the dynamic range of the D/A converter and thus allowing for a cleaner transmitted signal (as internal noise from the D/A converter is present when not operating in the D/A converter's dynamic range), as taught by Rakhib.

Kornfeld in view of Rakhib do not teach of the line-up of components as claimed. As the purpose of the invention is to provide means such that the dynamic range criteria of the D/A converter is met, it is believed that the merely moving and distributing the function of these components (ie the level adjusting circuit) to achieve this goal is obvious and not novel, as no benefit in changing component position or in distributing its function has been detailed. Therefore, it would have been obvious to one skilled in the art, at the time of invention, to have added multiple level adjusting circuits at the output of the baseband band filters and prior to the summer for the purposes of obtaining a baseband signal that was within the dynamic range of the D/A converter and would thus allow for a less noisy baseband signal to be transmitted.

9. Claims 8, 9, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kornfeld et al. (Kornfeld, US Patent No. 5,974,041) in view of Wright et al. (Wright, US Patent No. 6,054,894).

Regarding claim 8, Kornfeld teaches of a baseband signal multiplexing circuit for multiplexing a plurality of baseband signals spread with different spread codes into one baseband signal comprising a plurality of baseband filters for respectively limiting bands of the respective baseband signals input thereto (as seen in Figure 7 and detailed in column 10, lines 64 – 67), adding means for adding and code-multiplexing the plurality of baseband signals with the bands limited by said respective baseband filters to produce one baseband signal (as seen in Figure 7 and detailed on lines 3-7), and D/A converting means for converting the baseband signal which is a digital signal (outputted from said adding means into) an analog signal (as seen in Figure 7 and detailed in column 11, lines 1- 7).

Kornfeld does not teach of the baseband filters being able to adjusting amplitude values of the respective baseband signals based on a control signal to output the signals nor of a gain setting means for calculating a gain set value with which an amplitude value of the baseband signal outputted from said adding means is adjusted to an amplitude value matching a dynamic range of said D/A converting means based on the number of transmission codes which is the number of multiplexed baseband signals and for notifying said level adjusting means of the gain set value with said control signal.

In a related art dealing with a digital linear nonlinear component power amplifier, Wright teaches of the baseband filters being able to adjusting amplitude values of the respective baseband signals based on a control signal to output the signals (seen in Figures 2 as block 21 and further detailed in Figures 9 and 10, descriptions given in column 13, lines 26 – 29, column 14, lines 13 – 20 and lines 41 – 45). Wright further teaches of a gain setting means for calculating a gain set value with which an amplitude value of the baseband signal outputted from said adding means is adjusted to an amplitude value matching a dynamic range of said D/A converting means based on the number of transmission codes which is the number of multiplexed baseband signals and for notifying said level adjusting means of the gain set value with said control signal (seen in Figure 2 as block 28, details given starting column 8, line 63 and ending column 9, line 5).

It would have been obvious to one skilled in the art at the time of invention to have included into Kornfeld's system of baseband transmission, the system of adaptively adjusting the filter parameters as described by Wright for the purposes of reducing IQ cross-talk and DC offsets (both which directly relate to dynamic range considerations, as commonly known in the

multiplied by each of tap outputs obtained by delaying the input baseband signals by a certain time period.

In a related art dealing with a digital linear nonlinear component power amplifier, Wright teaches of calculating a gain set value with which amplitude values of the respective baseband signals input thereto match a dynamic range in D/A conversion based on the number of transmission codes which is the number of multiplexed baseband signals (column 14, lines 38 – 50; namely lines 42 - 45), and of limiting bands of the input respective baseband signals and adjusting the amplitude values of the respective baseband signals based on the gain set value by selecting a filter coefficient to be multiplied by each of tap outputs obtained by delaying the input baseband signals by a certain time period (column 13, lines 26 – 29 and column 14, lines 12 - 34).

It would have been obvious to one skilled in the art at the time of invention to have included into Kornfeld's system of baseband transmission, the system of adaptively adjusting the filter parameters as described by Wright for the purposes of reducing IQ cross-talk and DC offsets (both which directly relate to dynamic range considerations, as commonly known in the art) and thus allowing for a cleaner transmitted signal (as internal noise from the D/A converter is present when not operating in the D/A converter's dynamic range), as taught by Wright.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tanmay S Lele whose telephone number is (703) 305-3462. The examiner can normally be reached on 9 - 6:30 Monday – Thursday and on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dwayne Bost can be reached on (703) 305-4778. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.

Tanmay S Lele
Examiner
Art Unit 2681

tsl
August 14, 2002

Nay Maung
NAY MAUNG
PRIMARY EXAMINER